

Listing of Claims:

Claims 1-8 (Canceled).

9. (Currently Amended) A radio-frequency electric current ablation catheter comprising:

a tip electrode;

5 ~~means for detecting~~ a unit which detects a temperature of the tip electrode;

a catheter shaft; and

[[a]] an operating ~~portion for operation~~ at a proximal end,

10 ~~wherein the tip electrode is formed of a single metallic body and a surface of the tip electrode comprises at least has a shape formed by connecting three or more~~ spherical or approximately spherical surfaces ~~having~~ which have centers on a same straight line ~~to each other with a curved surface and a reduced-diameter portion provided between each of the adjacent spherical or approximately spherical surfaces such that the~~
15 adjacent spherical or approximately spherical surfaces are connected by a curved surface, wherein each said reduced-diameter portion has an outer diameter that is less than an outer diameter of each of the spherical or approximately spherical surfaces.

10. (Currently Amended) The ablation catheter according to Claim 9, wherein at least one of the ~~three or more~~ spherical or approximately spherical surfaces is a surface selected from a spherical surface, a surface of an ellipsoid of revolution having an axis on a central axis of the catheter, an egg-shaped surface having an axis on ~~[[a]]~~ the central axis of the catheter and a hemispherical surface having an axis on ~~[[a]]~~ the central axis of the catheter.

11. (Previously Presented) The ablation catheter according to Claim 9, wherein the tip electrode has a length of 0.5 to 15 mm and a maximum outer diameter of 0.5 to 3 mm.

12. (Previously Presented) The ablation catheter according to Claim 10, wherein the tip electrode has a length of 0.5 to 15 mm and a maximum outer diameter of 0.5 to 3 mm.

13. (Currently Amended) The ablation catheter according to Claim 11, wherein ~~when~~ an average diameter of ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by D_1 and a distance between the centers of the ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by d , and d/D is 0.1 to 2 ~~with respect to~~

~~entire combinations for each combination~~ of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces.

14. (Currently Amended) The ablation catheter according to
Claim 12, wherein ~~, when~~ an average diameter of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces is
represented by D_1 ~~and~~ a distance between ~~the~~ centers of the
5 ~~adjacent~~ two adjacent spherical or approximately spherical
surfaces is represented by d , and d/D is 0.1 to 2 ~~with respect to~~
~~entire combinations for each combination~~ of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces.

15. (Currently Amended) The ablation catheter according to
Claim 11, wherein ~~, when~~ an average diameter of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces is
represented by D_1 ~~and~~ a distance between ~~the~~ centers of the
5 ~~adjacent~~ two adjacent spherical or approximately spherical
surfaces is represented by d , and d/D is 0.5 to 1.25 ~~with respect~~
~~to entire combinations for each combination~~ of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces.

16. (Currently Amended) The ablation catheter according to
Claim 12, wherein ~~, when~~ an average diameter of ~~adjacent~~ two
adjacent spherical or approximately spherical surfaces is

represented by D_1 ~~and~~ a distance between the centers of the
5 ~~adjacent~~ two adjacent spherical or approximately spherical
surfaces is represented by d , and d/D is 0.5 to 1.25 ~~with respect to entire combinations for each combination of adjacent two~~
adjacent spherical or approximately spherical surfaces.

17. (Previously Presented) The ablation catheter according to Claim 9, wherein the tip electrode has a length of 1 to 12 mm and a maximum outer diameter of 1 to 2.7 mm.

18. (Previously Presented) The ablation catheter according to Claim 10, wherein the tip electrode has a length of 1 to 12 mm and a maximum outer diameter of 1 to 2.7 mm.

19. (Currently Amended) The ablation catheter according to Claim 17, wherein ~~when~~ an average diameter of ~~adjacent~~ two
5 ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by D_1 ~~and~~ a distance between the centers of the
surfaces is represented by d , and d/D is 0.1 to 2 ~~with respect to entire combinations for each combination of adjacent two~~
adjacent spherical or approximately spherical surfaces.

20. (Currently Amended) The ablation catheter according to Claim 18, wherein ~~when~~ an average diameter of ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by D_1 ~~and~~ a distance between the centers of the ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by d , and d/D is 0.1 to 2 ~~with respect to entire combinations for each combination of adjacent two adjacent~~ spherical or approximately spherical surfaces.

21. (Currently Amended) The ablation catheter according to Claim 17, wherein ~~when~~ an average diameter of ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by D_1 ~~and~~ a distance between the centers of the ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by d , and d/D is 0.5 to 1.25 ~~with respect to entire combinations for each combination of adjacent two adjacent~~ spherical or approximately spherical surfaces.

22. (Currently Amended) The ablation catheter according to Claim 18, wherein ~~when~~ an average diameter of ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by D_1 ~~and~~ a distance between the centers of the ~~adjacent~~ two adjacent spherical or approximately spherical surfaces is represented by d , and d/D is 0.5 to 1.25 ~~with respect~~

~~to entire combinations~~ for each combination of adjacent two
adjacent spherical or approximately spherical surfaces.

23. (New) The ablation catheter according to claim 9,
wherein a shape of a longitudinal section of the curved surface
is a smoothly curved line, a first end of the curved line is
tangent to a circle or an approximate circle which is a shape of
5 a longitudinal section of one of the adjacent spherical or
approximately spherical surfaces, a second end of said curved
line is tangent to another circle or approximate circle which is
a shape of a longitudinal section of another of the adjacent
spherical or approximately spherical surfaces, and the curved
10 line is closest to said straight line at an approximately middle
point between the first and second ends.

24. (New) The ablation catheter according to claim 9,
wherein the tip electrode is formed of a material selected from
the group consisting of gold, stainless steel, platinum,
platinum-iridium alloys, platinum-tungsten alloys, and tickel-
titanium shape memory alloys.